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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/967,048	09/28/2001	Athanasios A. Kasapi	15685P108	4810

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BLAKELY SOKOLOFF TAYLOR & ZAFMAN  
12400 WILSHIRE BOULEVARD  
SEVENTH FLOOR  
LOS ANGELES, CA 90025-1030

EXAMINER

VU, THAI

ART UNIT	PAPER NUMBER
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2687

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/967,048	<b>Applicant(s)</b> KASAPI, ATHANASIOS A.	
	<b>Examiner</b> Thai N. Vu	<b>Art Unit</b> 2687	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 October 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 7-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Shapira (U.S. Patent #: 6,697,641; hereinafter Shapira).

Regarding claim 7, Shapira teaches a transceiver comprising:

a diversity agent (FIG. 15, diversity agent including units 970, 972, 976, 950-966) to selectively develop and apply a set of complex weight values to each of a plurality of signals, each corresponding to a sub-carrier of a multi-carrier communication channel to introduce spatial diversity between such sub-carriers (FIG. 15 and column 2, lines 29-42, detector unit develop and apply weights to transmit channels); and

a transmit module, coupled with the diversity agent, to receive the modified sub-carriers and transmit the signals to generate a multi-carrier communication channel (FIG. 15, antennas 908 and 904 coupled to units 950-966) with intra-channel spatial diversity (column 2, lines 29-42).

Regarding claim 8, Shapira further teaches limitations of the claim in FIG. 15 and column 8, lines 16-19.

Regarding claim 9, Shapira further teaches limitations of the claim in FIG. 15 and column 2, lines 29-42 (Each of the TX channels is modified by a set of weights provided by units 950-966);

Regarding claim 10, Shapira further teaches limitations of the claim in FIG. 15.

Regarding claim 11, Shapira further teaches limitations of the claim in FIG. 15 (weights are provided by units 50-66) and column 4, lines 23-29 (weights inherently are chosen to help produce orthogonal vectors).

Regarding claim 12, Shapira further teaches limitations of the claim in column 4, lines 23-29 (weights are inherently subsequently different).

Regarding claim 13, Shapira further teaches limitations of the claim in FIG. 15, block 403 and column 2, lines 39-43 and FIG. 8 (up converters are inherently included).

Regarding claim 14, Shapira further teaches limitations of the claim in FIG. 10, mobile station 140.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2687

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanzaki (U.S. Patent #: 5,652,764) in view of Shapira.

Regarding claim 1, Kanzaki teaches a method comprising:

receiving information for transmission to a receiver (FIG. 10, transmission data);

and

generating a plurality of sub-carriers to redundantly transmit the information to a user over a multi-carrier wireless communication channel (FIG. 10, transmission data is transmitted using different carriers, column 7, lines 21-27),

It should be noticed that, Kanzaki fails to teach the feature of each of the sub-carrier signal is modified by a set of complex weights to ensure that each of the sub-carriers of the wireless communication channel propagates along a different physical path to the receiver. However, Shapira teaches

each of the carrier signals is modified by a set of complex weights (FIG. 15, each transmit signal is modified by a set of weight  $W$ ; 950, 952, 954,...966) to ensure that each of the sub-carriers of the wireless communication channel propagates along a different physical path to the receiver (FIG. 8) for providing communication using a multiple antennas.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of the feature of each of the sub-

carrier signal is modified by a set of complex weights to ensure that each of the sub-carriers of the wireless communication channel propagates along a different physical path to the receiver, as taught by Shapira, in view of Kanzaki in order to enhance performance of the base station having multiple antennas.

Regarding claim 2, Shapira further teaches limitations of the claim in column 10, lines 23-27 and lines 49-59.

Regarding claim 3, Shapira further teaches limitations of the claim in (FIG. 15, column 10, lines 23-27 and lines 49-59 – each sub carriers are modified by different weights);

Regarding claim 4, Shapira further teaches limitations of the claim in column 4, lines 23-29 (weights inherently are chosen to help produce orthogonal vectors).

Regarding claim 5, Kanzaki further teaches limitations of the claim in (column 8, lines 24-27).

Regarding claim 6, Shapira further teaches limitations of the claim in FIG. 7.

Regarding claim 15, Shapira teaches all subject matter as claimed above except for the feature of a memory having stored therein content; and control logic, coupled to the memory, to access and process at least a subset of the content to implement the diversity agent. However, Kanzaki teaches limitations of the claim in FIG. 4 and column 8, lines 24-27.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of the feature of a memory having stored therein content; and control logic, coupled to the memory, to access and process

at least a subset of the content to implement the diversity agent, as taught by Kanzaki in view of Shapira in order to improve transmission diversity.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai N. Vu whose telephone number is 703-305-3417. The examiner can normally be reached on 9:00AM-7:00PM, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on 703-306-3016. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thai N. Vu  
Examiner  
Art Unit 2687

  
**ELISEO RAMOS-FELICIANO**  
**PATENT EXAMINER**

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